KANSAS DEPARTMENT OF REVENUE

PROJECT 2010

FEASIBILITY STUDY REPORT

BASELINE ANALYSIS

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4. BASELINE ANALYSIS

4.1 Current Method

VIPS, KDLS, and KVIS are significant systems, each individually vital to carrying out mission-critical, statutorily-mandated, objectives of the Kansas Department of Revenue. These systems manage and retain all current and historical driver license and vehicle registration data, as well as enforce critical business rules in compliance with state and federal laws. The following sections describe the current method of operation:

Objectives of the Current Systems

The objectives of the current (legacy) VIPS, KDLS, and KVIS systems are to directly support state and county staff charged with delivery of vehicle titling and registration services, and driver's licensure and control services, to Kansas citizens. Additionally, these systems support the related operational processes of financial transaction management, accounting, and inventory supply chain and control.

Ability of the System to Meet Workload Requirements

While the proposed solution is being developed and implemented, the current legacy, mainframe-based hosting environments for the VIPS, KDLS, and KVIS systems can be operationally maintained in their current state with substantial and continued investment and maintenance. This will minimally meet the interim technical transaction volumes, automated processing workloads, and storage requirements needed to provide VIPS, KVIS and KDLS functions.

Level of User and Technical Staff Satisfaction

The level of user and technical staff satisfaction with the current systems is moderate to low. The systems do support basic business transaction processing needs, although with a significant dependence upon the institutional knowledgebase which exists in the aging KDOR business and technical workforce.

The users of the system have identified significant areas in need of improvement. These improvements will result in better customer service, improved accounting and management control, fewer manual work processes and a potential for reduced costs.

From a technical staff support perspective, the current systems require extraordinary support to be kept synchronized, updated, and maintained to meet minimum operational and availability service levels. Significant areas requiring improvement in the current technical architecture have been identified. After the needs are addressed by the proposed solution, overall improved service levels, a potential for reduced costs, and a higher level of operational efficiency are expected as a result.

Implementation of these improvements, with the higher degree of automated business rule driven processing, is paramount to effective, efficient, and accurate processing and technical support by the next generation of KDOR associates.

Data Input, Output, Processing, and Related Manual Procedures

Data input is primarily supported using "green screen" terminal-based online interfaces located in County Treasurer's offices, official Kansas Driver's License examining stations, and at central state offices. The data entry is edited either in real-time or in subsequent batch processing, which provides error reporting for manual error review and correction.

Bar code readers are implemented at most county treasurer sites, which reduces some of the manual data entry required in VIPS. Alternative graphical user interface (GUI) data entry using "screen-scraping" (EHLLAPI-based) applications interact with FileNET queues via a work management framework called @work for KDLS functionality. Customer self-service features are extended to the Internet, for selected functions (e.g. WebTags and eLien transactions), and the resulting transactional data is processed and replicated regularly to the central VIPS repository. In other cases, data is populated through automated electronic interfaces (e.g. Kansas Courts for convictions and reinstatement and KDOT for accident reporting),

The system databases for VIPS, KDLS, and KVIS are typically not updated in real-time, but instead rely on daily batch file transfer for updating, synchronizing, consolidating and processing business transactions.

Data output is generally limited to predefined online inquiry and reporting which have been developed for the system. Some output is directed to service providers outside of KDOR, who for example, produce and mail driver's licenses, or print and mail vehicle registration renewals.

Data Characteristics

VIPS, KDLS, and KVIS systems process and store data about individuals (specifically, 1.8 million Kansas drivers and owners of 2.5 million Kansas motor vehicles), vehicle titles, tags, permits, along with thousands of registrations and license renewal transactions per day.

The data structures supporting VIPS, KDLS, and KVIS have been designed and optimized to support each of the three individual "vertical" applications, without consideration of a unified customer/encounter record point-of-integration.

Data for the systems is predominantly stored within ADABAS, a non-relational database product which historically has been optimized for OLTP (On Line Transaction Processing) applications.

File transfer and batch processing mechanisms employed to integrate disparate data systems or synchronize transactions across a distributed data model, hinder each system user's ability to reference a single (definitive) record-of-authority for critical transactions.

Data systems are integrated with enterprise document/image management libraries deployed in FileNET architecture, as well as a legacy, microfilm-based, manual image retrieval system.

Currently, the systems data for VIPS, KDLS, and KVIS:

- is not optimally normalized for efficient data storage and processing
- lacks relational integrity controls, which negatively impacts data quality
- contains multiple/duplicate "person" records separately maintained in separate VIPS and KDLS databases
- is "out-of-current" by one or more days, as the definitive record-of-authority for a particular registration, permit, registration renewal, title, etc.
- may exist in one or more locations; and
- synchronization of the distributed data can be unreliable.

Although data is often viewed as "out-of-current" due to the nature of delayed transaction updates through batch processing, standards for overall data quality are well managed, understood, and reviewed by program staff.

System Provisions for Security, Privacy, and Confidentiality

Security in the current systems is effectively enforced, although through many different means, and is tied to individual network, platform, application, or database components of the collective system. There is no single (all inclusive) security authentication, authorization, access, and audit mechanism in place today which spans the entirety of the system.

The complexity of the current VIPS, KDLS, and KVIS security architecture requires that a new user be separately enrolled in several different security directory services and authorization systems (depending on their role and access requirements). The complexity of the current security architecture impedes efficient security administration and audit processes.

Privacy and confidentiality measures are generally enforced through policy and procedures, with some restrictions implemented via automated system controls. The policy change prohibiting SSN's from being used as a Driver's License number, will further serve to reduce risks to privacy and confidentiality.

Hardware Requirements for Current System

The following hardware components support the current system:

- s/390 Mainframe, AS/400 Midrange, Sun Solaris, and Wintel-based Servers
- FileNET Image and Work Queue Management Servers
- Optical Storage/Retrieval Servers (OSAR) and Magnetic Storage/Retrieval Servers (MSAR)
- Microfilm Readers
- Bar Code Wands; 2D Bar Code Readers (VIPS only County Treasurers Offices)
- Digimarc Photo ID System and Central Image Repository Servers
- System-attached and PC-attached Printers
- Windows-based Desktop and Notebook Computers
- TCP/IP based Frame Relay, Internet, and/or Dedicated Network Connections
- Virtual Private Network (VPN)
- Offsite Disaster Recovery Site Hardware

Software Characteristics for the Current System

The current systems are built upon a framework of 3GL (3rd Generation Language) programming languages, with procedural logic/constructs, in a distributed database environment, utilizing file transfer and batch processing for integration, and built primarily upon a non-relational database management systems.

The following database management systems (DBMS) support the current system:

- ADABAS on S/390 Mainframe System
- DB2/400 on AS/400 Midrange System
- Oracle on Sun Solaris
- Microsoft SQL Server on Windows

The following operating environments and application servers support the current system:

- 5250 and 3270 Enhanced Terminal Emulation
- Microsoft Internet Information Services (IIS)
- FileNET Image Management Services (IMS)

The following application development programming languages are used in the current system:

- COBOL
- NATURAL
- Visual Basic
- VB.NET
- PowerBuilder

Interfaces and Stakeholders

Figures 1, 2, and 3 graphically depict the internal and external logical interfaces and also show the relationships of various stakeholder entities associated with each of the systems. A summary of the interfaces, stakeholders, and their characteristics follows:

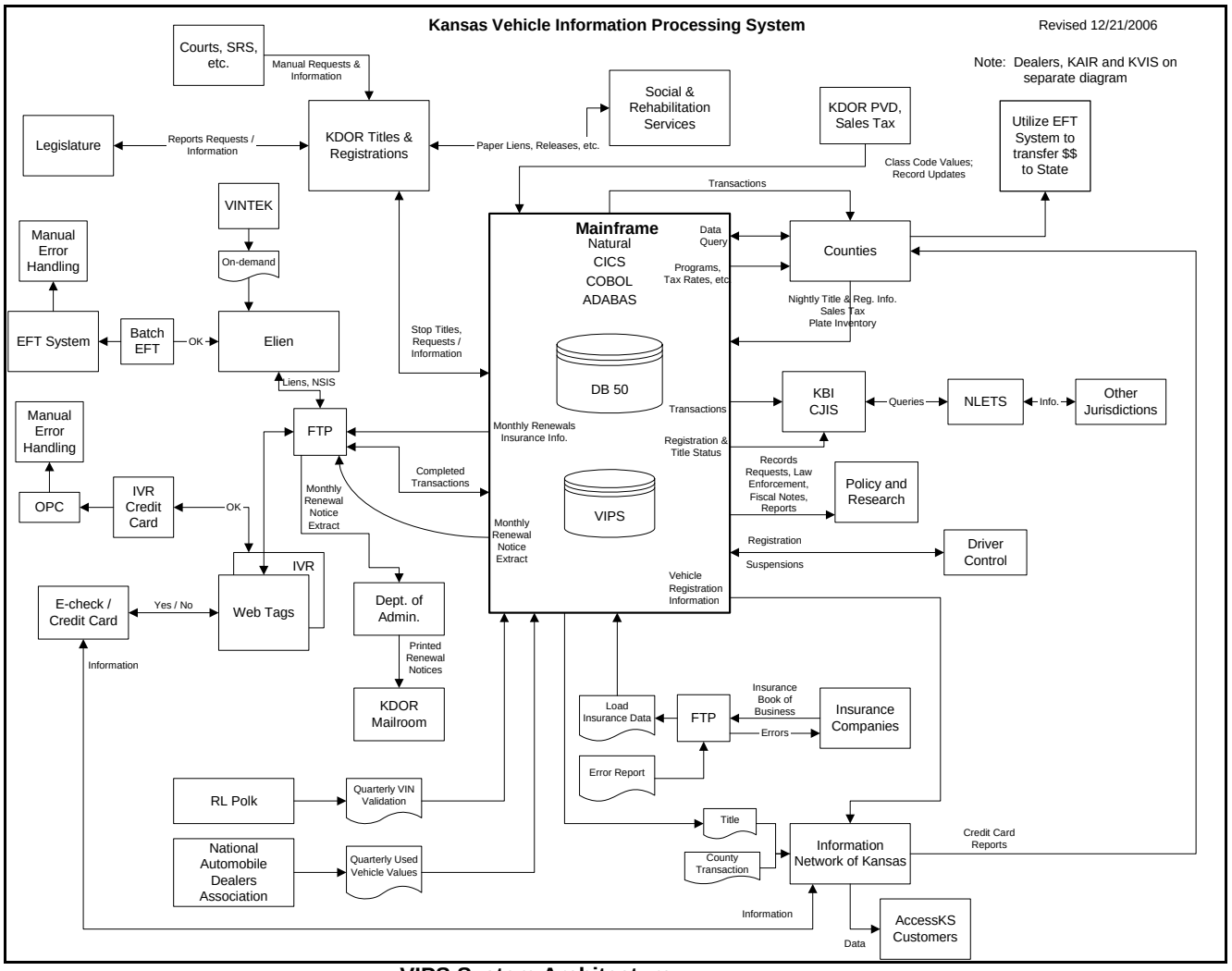
Interface Name	System	Type	Description
County Treasurer Offices	VIPS	Electronic Batch	Upload of daily county transaction data nightly, and download of software updates and reference/lookup table data on an as-needed basis.
eLien	VIPS	Electronic Batch	Replication of monthly/pending renewals, and return of completed eLien registrations
WebTags	VIPS	Electronic Batch	Replication of monthly/pending renewals to portal, and return of completed WebTags registrations
Property Valuation	VIPS	Electronic Batch	Value release forms property tax transactions
Sales Tax	VIPS	Electronic Batch	Sales tax transactions
RL Polk	VIPS	Electronic Batch	VIN validation/cross-check services
NADA	VIPS	Electronic Batch	Vehicle valuation data
Insurance Companies	VIPS	Electronic Batch	Insurance “book of business” uploads and error listing return
AccessKansas/INK	VIPS	Electronic Batch	Electronic registration renewals and payments E-Lien Digital Certificates

KBI/CJIS	VIPS Dealers	Electronic Batch	Vehicle registration data updates Dealer crime felony lookups
Driver's License Stations (including County Treasurer Offices and AAA)	KDLS	Electronic Interactive	Interactive (online) drivers license processing, address changes, and print streams. Also includes Digimarc driver's license photo ID system interface to FileNET, and KBI/CJIS for registered offenders.
Digimarc Photo ID System	KDLS	Electronic Batch	Upload of driver's photos/signatures to FileNET image library
AAMVA Portal	KDLS	Electronic Interactive	SSN validation (through SSA), and inter-state driver conviction, suspension, revocation cross-check
HAVA Portal	KDLS	Electronic Batch	Motor voter DMV cross-check (Help America Vote Act)
SRS	KDLS VIPS	Electronic (planned)	Child support information/crosschecks Liens on titles
Kansas Courts	KDLS	Electronic Paper	Acceptance of traffic convictions and specific suspension/reinstatement action electronically from Kansas courts. All other work is submitted by paper.
KDOT	KDLS	Electronic Batch	Accident reports
Attorney General	KDLS	Electronic Batch	Concealed carry registration flag
Organ Donor Registry	KDLS	Electronic Batch	Weekly upload
Selective Service Board	KDLS	Electronic Batch	Weekly upload
County Treasurer Offices	KVIS	Electronic Batch	Inventory receipts, updates, and inter-county transfers
STARS	KVIS VIPS	Electronic Batch	Invoices, accounting, and payment processing Refunds and re-imbursements to counties & KDOR staff
Dealer's Web System	KVIS VIPS	Electronic	Dealer tag inventory issuance Dealer tag displayed for law enforcement
Center Industries	KVIS	Electronic Batch	Purchase orders and inventory receipts
CARS	ALL	Manual	Microfilm-based storage and manual retrieval system

Stakeholder Name	System	Description
Kansas Legislature	ALL	Requests for information
NLETS and other state law enforcement jurisdictions	ALL	The international justice and public safety information-sharing network
KDOR Policy and Research	ALL	Requests for information
KDOR Budget	ALL	Requests for information
KDOR Motor Carrier Service Bureau	ALL	Requests for information
Courts	ALL	Requests for information
Other State of Kansas agencies	ALL	Requests for information
State Farm and other insurance agencies	ALL	Requests for information
3M Company	KVIS	Raw materials/supplies ordering

FIGURE 1

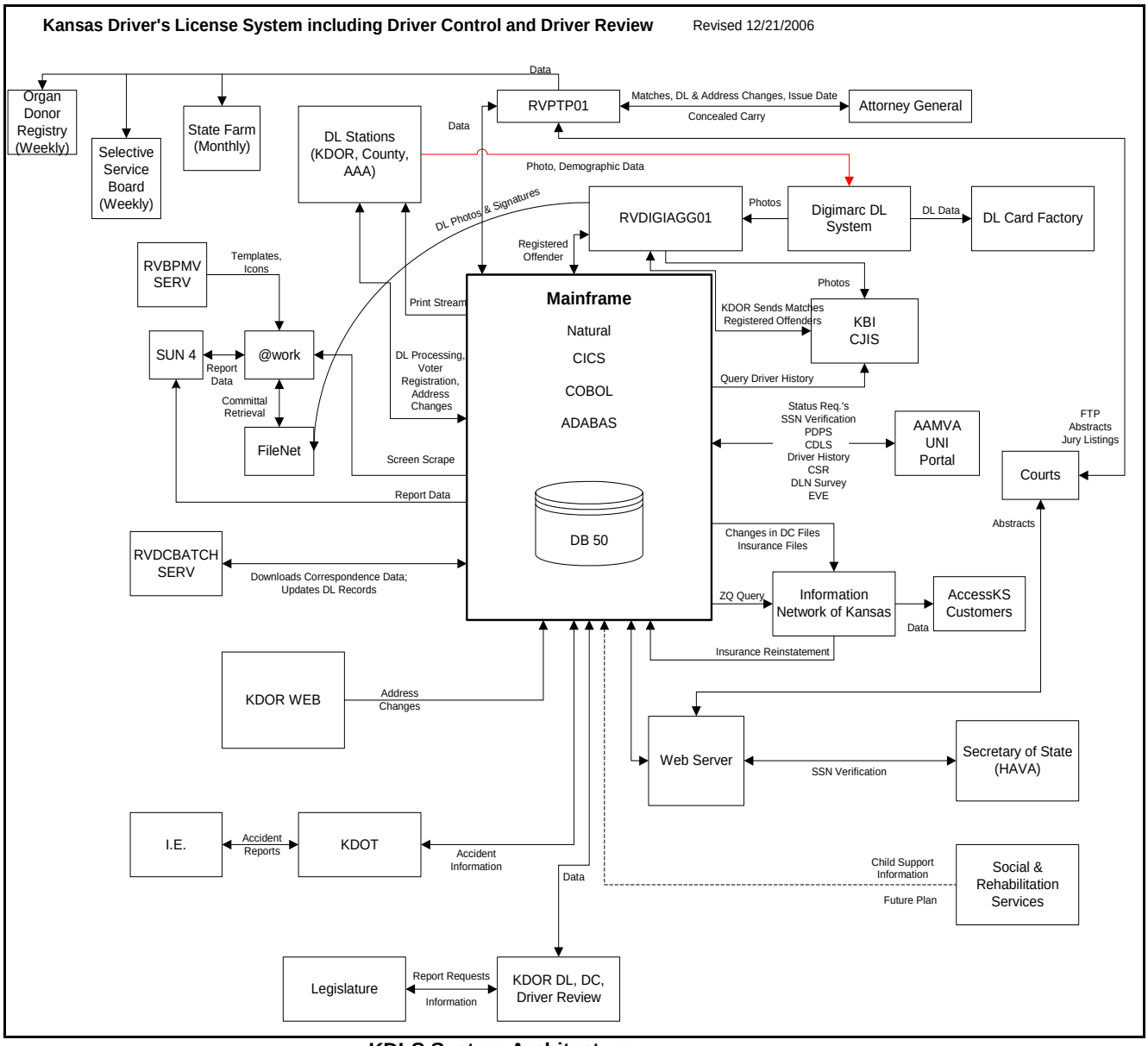
The following diagram depicts an overview of VIPS system architecture, showing logical components, general process flows, internal interfaces, and external interfaces to stakeholder organizations.



VIPS System Architecture

FIGURE 2

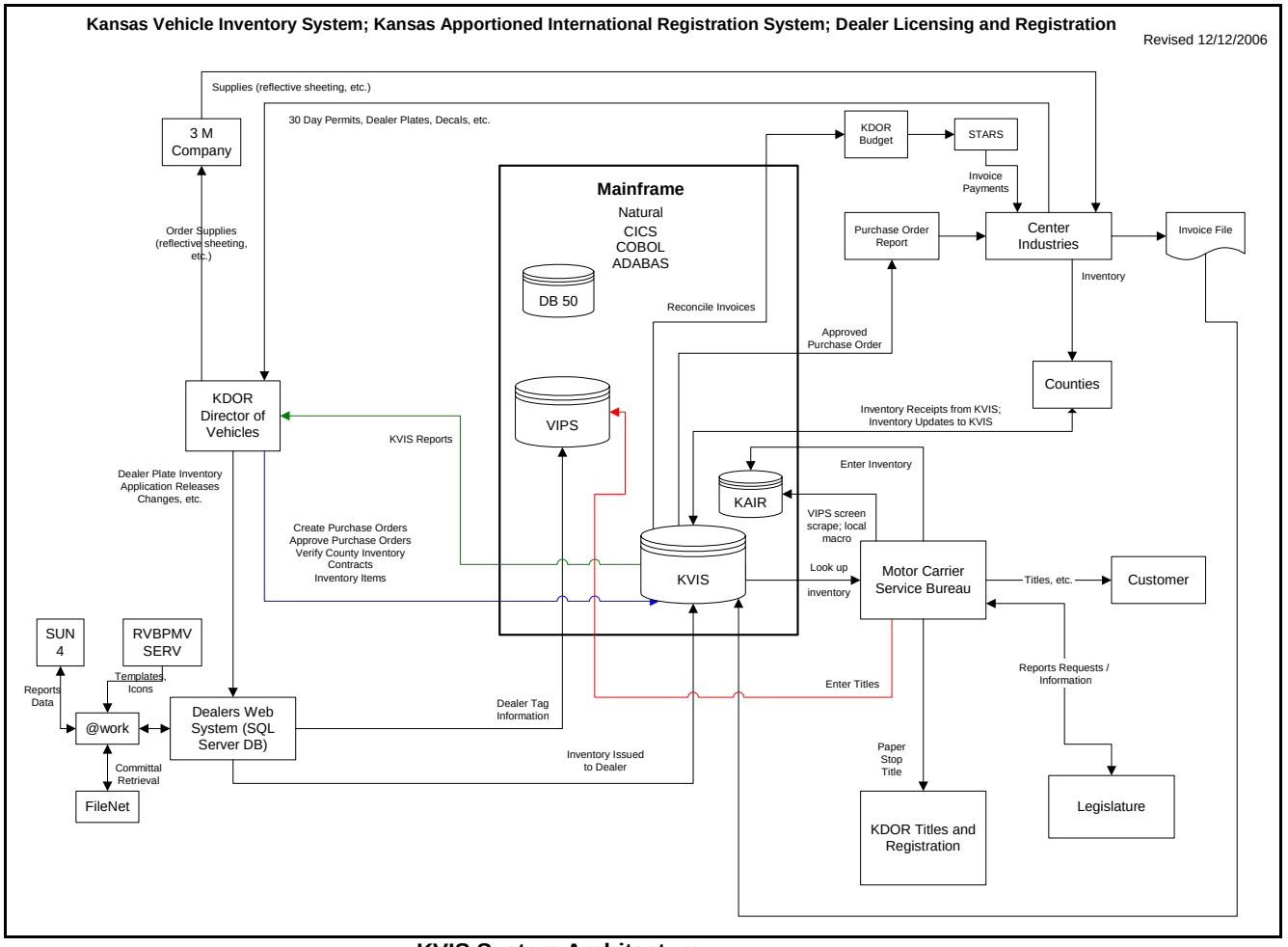
The following diagram depicts an overview of KDLS system architecture, showing logical components, general process flows, internal interfaces, and external interfaces to stakeholder organizations.



KDLS System Architecture

FIGURE 3

The following diagram depicts an overview of KVIS system architecture, showing logical components, general process flows, internal interfaces, and external interfaces to stakeholder organizations.



KVIS System Architecture

Personnel Requirements

A total of 41 KDOR IT staff, including management, data entry, programming, database administration, operations, and helpdesk, are involved in supporting the current systems, at a total level of resource of approximately 20 FTE's allocated annually.

System Documentation

KDOR maintains technical documentation for system architecture, interfaces, source program listings, data file layouts, and configuration listings, at a level sufficient to sustain daily operation and program maintenance. User documentation is not current.

Failures of the Current System to Meet Objectives

The VIPS, KVIS, and KDLS systems were developed individually at different points in time, each with scope limited to providing support only for their respective, individual business program functions. These systems were implemented in legacy batch-driven architectures, use non-relational database design, and are accessed primarily through "green-screen" terminal-based interfaces. The current systems have resulted in business applications that fail:

- to share information across systems which requires duplicated maintenance of common customer data;
- to support authorized users and customers who need to easily and efficiently access both licensing and vehicle information;
- to provide "real time" updates to data managed by the systems;
- to provide a robust graphical user interface which is intuitive and easy to use; and
- to easily manage and control new releases of software across all locations.

These current systems fail to meet critical business functional and technical support capabilities which will be required of the proposed system. These capabilities are:

- Integrated Word Processing
- Email Integration
- Document Imaging Integration
- Alerts and Messaging
- Standard and Customized Letters
- Suspend and Recall Transactions
- Advanced Printer Control
- Historical Transaction Inquiry
- Ad-Hoc Reporting and Standard Forms
- Financial Accounting Controls
- Exception Processing
- Records Requests
- Credit/Debit Card Payments
- Electronic Signature
- Multiple Transactions in Single Client Encounter

Due to the inherent constraints and age of the current systems, if not replaced, further investment in these systems would be required because:

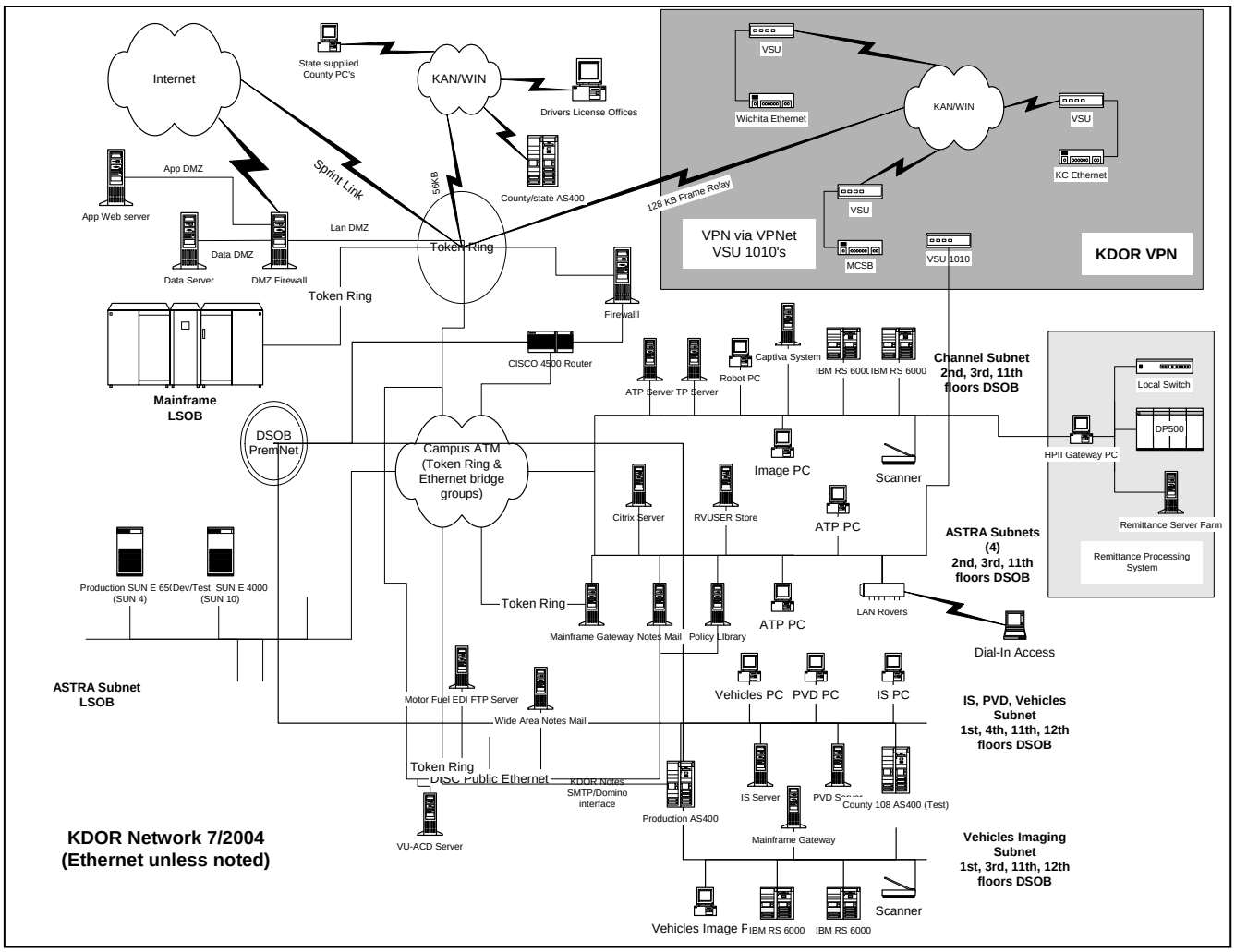
- the current systems do not meet, and cannot effectively be modified to meet, all of the projected future federal requirements and mandates for Real ID, which are expected to be in effect for all states prior to January, 2010;
- the current wide-area network capacity which serves the counties and drivers license examining stations, is sufficient for the distributed, batch-driven, architecture in place today, but does not meet the real-time data and document image sharing requirements which are required for both Real ID readiness and other functional requirements of the proposed solution; and
- the current AS/400 systems lifecycle is nearing its end within the next 2-3 years, which would require significant investment in order to refresh the hardware and software to the latest release levels for this legacy platform architecture.

4.2 Existing Infrastructure

KDOR IT supports a wide number of applications platformed on mainframe, midrange (AS/400), UNIX (Solaris), and client/server environments, in compliance with the State of Kansas Technical Architecture. Figure 4 depicts the KDOR Information Network, and illustrates the physical components in place today.

FIGURE 4

KDOR Information Network



KDOR Information Network

Most new applications are being developed using n-tier architectures with a thin client footprint or web based technology. The technical environment for the proposed system is expected to comply with this preferred KDOR technical architecture.

As described in the *KDOR 2007-2009 IT Management and Budget Plan* the department currently utilizes and supports:

- PC desktop and notebook-based workstations, running Windows-based operating systems, and utilizing enhanced 5250 and 3720 terminal emulation to midrange (AS/400) and mainframe (s/390) applications and resources.
- Mainframe, Windows, AS/400, and Sun Solaris application and database servers.
- State of Kansas wide area network (TCP/IP-based), and web browser based HTTP and HTML or XML protocols.
- Current application development is being accomplished using a variety of software products and languages including Powerbuilder, Microsoft .NET, COBOL, NATURAL, and Lotus Notes.
- Personal productivity software includes Microsoft Office suite products including word processing and spreadsheets, Lotus Notes email/calendaring, and FileNET document/image management software.
- Operating system software includes z/OS, OS/400, Sun Solaris, and Microsoft Windows.
- Database management software includes DB2/400, ADABAS, Oracle, and Microsoft SQL Server.
- KDOR uses a full life-cycle "waterfall" application development methodology that encompasses initial requirements definition, business and technical application design, programming and unit testing, integration testing, system and user testing prior to conversion and rollout of new systems.
- KDOR utilizes the State of Kansas Project Management Methodology (PMM).

Through the implementation of the proposed solution, the shortfalls and omissions inherent within the current legacy technical architecture can be addressed, while at the same time, moving KDOR towards the preferred strategic "future state" architectures which will be well supported into the foreseeable future.